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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,476	01/17/2002	Emmanuel Legendre	21.0886	1776
23718	7590	11/06/2003		
SCHLUMBERGER OILFIELD SERVICES 200 GILLINGHAM LANE MD 200-9 SUGAR LAND, TX 77478			EXAMINER GUTIERREZ, ANTHONY	
			ART UNIT	PAPER NUMBER
			2857	

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/031,476

Applicant(s)

LEGENBRE ET AL.

Examiner

Anthony Gutierrez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in France on 8/5/99. It is noted, however, that applicant has not filed a certified copy of the French application as required by 35 U.S.C. 119(b).

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The revised abstract of the disclosure is objected to because it contains two phrases that should be avoided.

The phrase in line 3 "comprising the steps consisting in" should be avoided as it combines usage of the words "comprise" and "consist" and makes it unclear in assisting readers as to what characterizes the technical aspects of the present invention. Substitution of the word "of" for the phrase "consisting in" would be appropriate.

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The phrase in line 11 "the method being characterized by the fact that" should be avoided. Use of the word "fact" implies purported merits of the invention.

Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 15 and 28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Each independent claim has been amended to recite the limitation "taken simultaneously over all the layers of formations". It is unclear to the Examiner as to what is being "taken". The specific step that is performed "simultaneously over all layers of formations" should be distinctly claimed.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 15, 16, 18-22, 28, 29, and 31-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Barber et al. (US Patent 6,047,240).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

As to claims 15 and 28, Barber et al. discloses a method of determining parameters R_t , R_{x0} , and d_i of formations comprising multiple layers and through which a borehole passes, on the basis of a resistivity log recorded in the borehole by means of a measuring and recording tool (see Abstract, Figure 10, and col. 3, lines 26-29) the method comprising the steps of (1) determining the formation parameters by a quasi-Newton parameter inversion method (col. 6, lines 1-5) implemented on

pseudo-parameters that are homogeneous and that are determined from the formation parameters (col. 5, lines 11-19, where Barber et al. discloses that the equations are initially linearized by a Taylor's series expansion and where the voltage parameter V is a pseudo parameter determined from formation parameters) taken simultaneously over all the layers of formations, so as to obtain a model of the formations (col. 5, lines 20-40 and col. 5, line 59-col. 6, line 8); (ii) calculating the response of the tool to the model (col. 6, lines 8-11); (iii) using a comparison criterion for comparing the calculated response with the recorded log (col. 6, lines 11-13); (iv) performing at least one new iteration if the comparison criterion is not satisfied (col. 6, lines 14 and 15), and (v) determining the formation parameters from the calculated response (col. 6, lines 16-18).

As to claims 16 and 29, Barber et al. further discloses determining boundaries between geological beds prior to implementing the method (col. 5, lines 59-66).

As to claims 18 and 31, Barber et al. further discloses selecting a bed model for each geological bed prior to implementing the method (col. 5, lines 59-66).

As to claims 19 and 32, Barber et al. further discloses wherein the bed model comprises parameters concerning distance from the borehole axis so as to define radial zones about the axis, and a resistivity parameter within each radial zone defined in this manner (col. 5, lines 59-66 and Figs. 7-10) where "distance from the borehole axis so as to define radial zones about the axis" is implied in the Figures 7-10 that show invasion radius for the formations of interest and where resistivity and conductivity (the reciprocal of resistivity) are both resistivity parameters.

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As to claims 20, 21, 33, and 34, Barber et al. further discloses selecting observable magnitudes that includes defining a combination of data items from the log (col. 5, lines 51-55).

As to claims 22 and 35, Barber et al. further discloses selecting observable magnitudes and giving each observable magnitude a value for each geological bed (col. 5, lines 55-58).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 17, 23, 24, 30, 36 and 37, are rejected under 35 U.S.C. 103(a) as being unpatentable over Barber et al. (US Patent 6,047,240) in view of Lacour-Gayet (US Patent 4,486,836).

As to claims 17 and 30, Barber et al. discloses determining bed boundaries (col. 5, lines 65-66).

Barber et al. does not specifically disclose determining the bed boundaries on the basis of points of inflection in log data.

Lacour-Gayet, however, discloses determining bed boundaries on the basis of points of inflection in log data (col. 5, line 44-col. 6, line 40).

It would have been obvious to one of ordinary skill in the art at the time of invention to utilize inflection in log data for the determination of the bed boundaries in the method of Barber et al. in order to more accurately determine beds that are of sufficient vertical extent for the method, a benefit taught by Lacour-Gayet (col. 6, lines 15-22).

As to claims 23 and 36, Barber et al. discloses giving each observable magnitude a value for each geological bed (col. 5, lines 59-66).

Barber et al. does not specifically discloses wherein the step of giving each observable magnitude a value for each geological bed comprises interpolating, within each layer, values of the observable magnitude as determined within each bed.

Lacour-Gayet, however, discloses comprises interpolating, within each layer, values of the observable magnitude as determined within each bed (col. 12, lines 31-49).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Barber et al. in view of Lacour-Gayet, in order to provide correction for the special situation at a boundary of a layered formation, thereby providing a more comprehensive log.

As to claims 24 and 37, Barber et al. discloses giving each observable magnitude a value for each geological bed (col. 5, lines 59-66).

Barber et al. does not specifically disclose giving the observable magnitude the value it possesses at a measurement point closes to the middle of the bed.

Lacour-Gayet, however implies that the value at the middle of the bed is significant for correcting the log (col. 15, lines 6-20).

It would therefore have been obvious to one of ordinary skill in the art at the time of invention to give the observable magnitude the value it possesses at a measurement point closes to the middle of the bed in order to provide a more accurate log with respect to bed boundaries.

10. Claims 25 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barber et al. (US Patent 6,047,240) in view of the cited web page (<http://www-fp.mcs.anl.gov/otc/Guide/OptWeb/continuous/unconstrained/quasi.html>).

As to claims 25 and 38, Barber et al. discloses determining parameters from the log data by a quasi-Newton method (col. 6, lines 1-5).

Barber et al. does not specifically disclose that the quasi-Newton method is performed by estimating the Jacobian of the problem by Broyden's method.

The cited web page however, discloses a quasi-Newton method that is performed by estimating the Jacobian of the problem by Broyden's method (page 1, last line – page 2, line 1).

The cited passage of the cited web page further teaches that practical experience, and some theoretical analysis, has shown this method to be the method of choice in most circumstances.

Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention to perform the quasi-Newton method integral to the invention taught by Barber et al., by using Broyden's method in order to benefit by its superior practical and theoretical applications as well as its familiarity to one of ordinary skill in the art for the sake of efficiently and accurately performing the method of Barber et al.

11. Claims 26 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barber et al. (US Patent 6,047,240) in view of Fanini et al. (US Patent 5,585,727).

As to claims 26 and 39, Barber et al. discloses a method for evaluating borehole resistivity using an induction logging sonde which commonly employ induced current loops and varying voltage for formation related measurements (col. 1, lines 7-29).

Barber et al. does not specifically disclose the use of a Dual Laterolog.

Fanini et al. however, discloses that a dual laterolog is a type of galvanic instrument which makes use of voltage difference and current flow measurements that are related to the electrical resistivity of the earth formations (col. 1, lines 32-51).

In the cited passage, Fanini et al. further teaches that the dual laterolog makes use of focusing electrodes used to constrain flow of the measuring current in a predetermined pattern in order to relate resistivity measurements more precisely to thin vertical sections of the earth formations and to enable measurement of formation resistivity at a distance closer to the borehole.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to employ a dual laterolog in the method taught by Barber et al. in order to provide more precise measurements and in order to provide a more comprehensive formation estimation.

12. Claims 27 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barber et al. (US Patent 6,047,240) in view of the Applicant's admitted prior art.

As to claims 27 and 40, Barber et al. discloses a method for evaluating borehole resistivity using an induction logging sonde which commonly employ induced current loops and varying voltage for formation related measurements (col. 1, lines 7-29).

Barber et al. does not specifically disclose the use of a high resolution laterolog.

The Applicant however discloses that it is possible to measure the resistivities using a high resolution laterolog array (page 6, lines 10-14).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use a high resolution laterolog array in the method taught by Barber et al. in order to benefit from it's superior high resolution capabilities.

Response to Arguments

13. Applicant's arguments with respect to claims 15-40 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed

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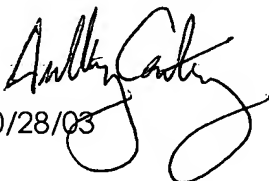
until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Gutierrez whose telephone number is (703) 305-1973. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc Hoff can be reached on (703) 308-1677. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0976.

Anthony Gutierrez


10/28/03


MARC S. HOFF
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